d) REMARKS

The claims are 1-9 with claims 1, 5 and 9 being independent. The amendments to the claims have been made to improve their format.

Claims 5-8 were withdrawn from consideration as drawn to a non-elected species since no allowable generic claims was said to be present. The Examiner argued that former claim 9 was not deemed generic to the species claims 1 and 5 on the ground that no isolation between the auxiliary electrode and the substrate was recited. Without necessarily admitting the propriety of this position, claim 9 has now been amended to specifically recite that which was implicit; i.e. that the auxiliary electrode is electrically isolated from the substrate in one embodiment. Therefore, claim 9 is generic to claims 1 and 5. Claims 5-8 should now be rejoined as a generic claim is present. To that end claim 5 has been amended pursuant to the amendments to claim 1.

The Examiner objected to the drawings on the ground that the specification mentioned sign 106 which was not present in the drawings. To resolve this issue, the specification has been amended to delete mention of reference numeral 106. The discharge electrode 105 serves as a cathode electrode and substrate 102 which serves as a counter electrode to discharge electrode 105 also serves as an anode electrode.

The Abstract has been amended to reduce its length, as required and to eliminate legal phraseology.

Claim 3 has been amended to resolve the objection under Rule 112, first paragraph.

Claims 1, 3, 4 and 9 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. 6,488,995 B1 (hereinafter referred to as "Nishimoto"). Claims 2 was rejected under 35 U.S.C. §103(a) as being unpatentable over Nishimoto in view of U.S. 5,472,508 (hereinafter referred to as "Saxena"). Claim 9 was rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. 6,348,238 B1 (hereinafter referred to as "Mizuno") in view of U.S. 3,757,733 (hereinafter referred to as "Reinberg"). The grounds of rejection are respectfully traversed. Prior to addressing the grounds of rejection, Applicants wish to briefly review certain key features and advantages of the present claimed invention.

An important feature of the present claimed invention is forming a deposited film on a substrate using a plasma CVD film-forming vessel while repetitively applying a periodicity voltage having at least two different waveform components having a different amplitude to an auxiliary electrode arranged either at a position in the plasma generation region of the film-forming vessel or on a side opposite a film-forming face of the substrate in the film-forming vessel. Support for this repetitive feature is found, inter alia, in the description of Figs. 5-8 and 18-21. The disclosure of "ONE REPETITIVE CYCLE" includes applying a voltage waveform comprising at least two different waveform components having a different amplitude. This feature is also supported, inter alia, on page 22, lines 20-25; page 57, lines 5-25 and page 73, line 8 to page 74, line 16. In the present invention, the ONE REPETITIVE CYCLE is repeated. This enables one to efficiently dissociate the raw material gas to produce precursors (SiH*, SiH_2*, SiH_3*, H*,

and the like) which contribute to forming a deposited film on the substrate at a high yield (see specification page 2).

The Examiner contends that col. 12, lines 8-16 of Nishimoto discloses formation of a deposited film on a substrate while applying a periodic voltage (RF voltage at 13.56 MHz) having at least two different waveform components having a different amplitude to an auxiliary electrode 208 arranged at a position in the plasma generation region of the film-forming vessel. However, column, lines 8-16 of Nishimoto actually discloses:

"Similarly, self-bias voltage generated in an RF electrode 208 is read by an RF reader 211, and the value read is sent to an RF controller 212. The RF controller 212 compares the self-bias voltage read with a reference value inputted in advance to automatically change the supply power of an RF power source (second high-frequency power source) 207 in such a manner that the self-bias voltage value becomes equal to the reference value."

This disclosure means that the self-bias voltage generated in the RF electrode 208 (which is arranged in the plasma generation region as an auxiliary electrode) during the film formation is controlled so as to become optimized. There is no teaching that the formation of the deposited film on the substrate is performed while repeatedly applying a periodic voltage having at least two different waveform components having a different amplitude to the auxiliary electrode 208.

Nishimoto does not teach or suggest that a voltage waveform comprising at least two different waveform components having a different amplitude is repeatedly applied.

Thus, it is apparent that the present invention is clearly distinguished from Nishimoto.

Regarding the rejection of claim 2, the Examiner admits that Nishimoto does not teach that the periodicity voltage has (i) a waveform component having an amplitude capable of generating mainly a radical of a silicon-containing compound and (ii) a waveform component having an amplitude capable of forming mainly a radical of hydrogen. The Examiner contends that Saxena teaches a CVD method wherein a voltage is applied to the auxiliary electrode 6, 8, having a pulse height (amplitude), pulse width, and pulse repetition appropriate for forming radicals of each species being deposited.

However, Saxena does not explicitly teach that a periodicity voltage having a waveform component having an amplitude capable of generating mainly a radical of a silicon-containing compound and a waveform component having an amplitude capable of forming mainly a radical of hydrogen is applied to the auxiliary electrode.

Regarding the rejection of claim 9, the Examiner contends that Mizuno describes that the formation of the deposited film on the substrate is performed while applying a periodic voltage having at least two different waveform components having a different amplitude to an auxiliary electrode arranged on a side opposite a film-forming face of the substrate in the film-forming vessel.

However, Mizuno merely discloses forming a deposited film on a substrate by forming a plasma in a space facing a surface of the substrate, biasing the substrate surface relative to a plasma space potential by imposing a voltage in a pulse form on the substrate, wherein a frequency of said voltage in the pulse form is less than an oscillation frequency of ions in said plasma, and using the bias to cause a thin film to be produced on the substrate surface as the ions in said plasma are caused to be incident on the substrate surface. A waveform of the voltage in the pulse form contains in each period a first pulse, a second pulse and a time in which no pulse is applied and a polarity of the second pulse. Mizuno does not explicity teach or suggest repeatedly applying a voltage waveform comprising at least two different components having a different amplitude.

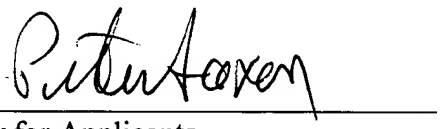
The defects of Mizuno are not remedied by Reinberg. Reinberg merely discloses that plasma CVD is used to deposit a silicon-containing film on a substrate using a mixture of a silicon-containing gas and at least hydrogen.

Wherefore, none of the references, whether alone or combined, discloses or suggests the present claimed invention nor renders it unpatentable.

It is requested that the claims be reconsidered, the case allowed and the application passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

Respectfully submitted,



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